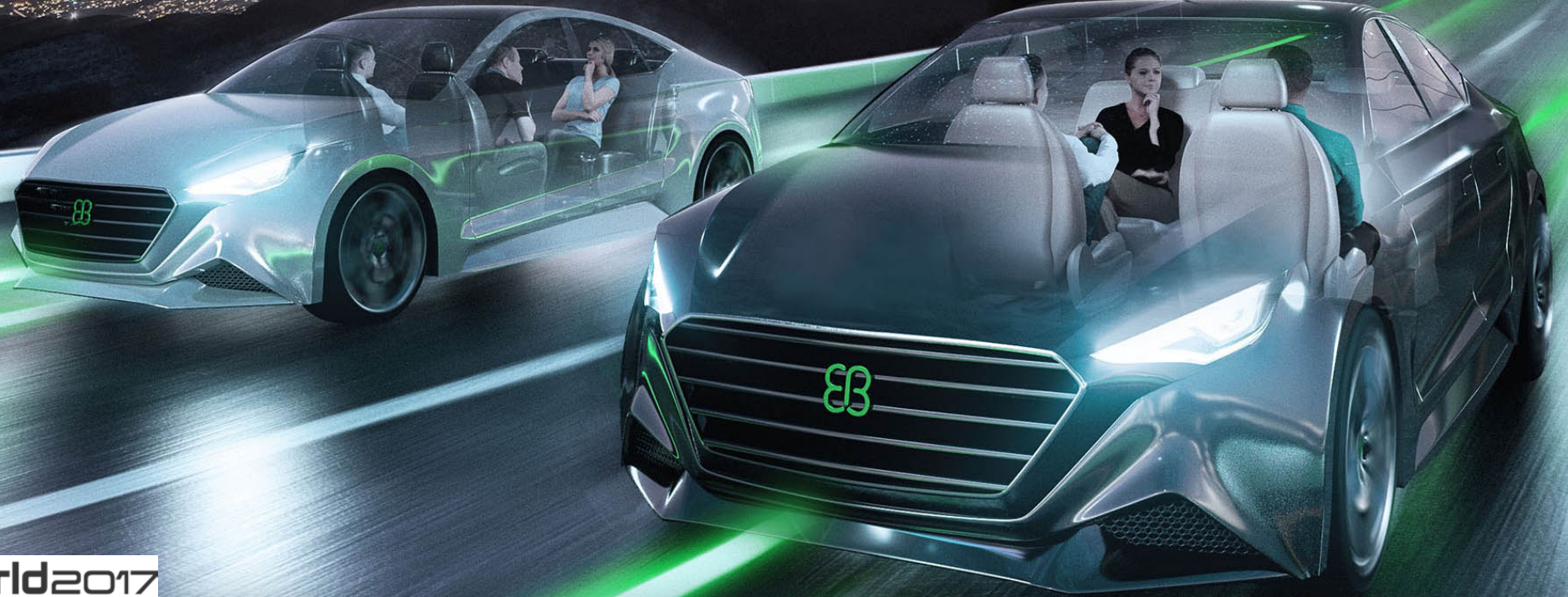


# Current Trends and Solutions in Securing Automotive Software



Elektrobit

Elisabeth Waitz  
14.03.2017







## Technical competencies

EB's technical core competencies are development of automotive-grade (software) products and engineering services.



## Global presence

Development and business offices in Austria, China, Finland, France, Germany, India, Japan, Romania and USA.



## Employees

More than 1,900 employees worldwide (including e.solutions). Spans three continents and nine countries.



## Continental AG

Wholly owned subsidiary of Continental AG.



## Consistent growth

Headcount growth in 2015: 7.2 %



## 90+ million

Over 90 million vehicles on the road and 1 billion embedded devices.

# Driving technology further



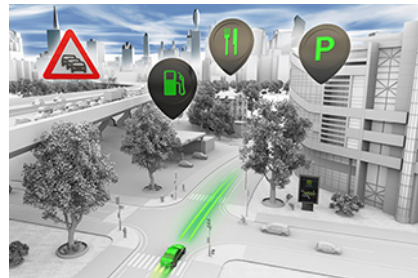
## Car Infrastructure

- AUTOSAR-Standard
- Single- & multi-core OS
- Functional Safety OS Embedded Security
- Automotive networks, e.g. Ethernet



## Driver Assistance

- Functional software architecture and modules for automated driving
- Electronic horizon reconstructor
- Sensor data fusion
- SW industrialization



## Navigation

- Navigation client for connected use cases
- Electronic horizon provider enabling map-based ADAS functions
- Scalability across classes through one-core principle



## HMI / Speech

- Model-based development of multimodal user interfaces
- From concept phase to series production
- Augmented reality solutions



## Connected Car

- Intelligent big data analytics & online diagnostics
- Scalable backend infrastructures
- Cyber security solutions
- Software updates over-the-air



## Software Factory

- SW Integration
- SW Engineering Service
- EB solys tooling for system analysis
- SW Factory for software Integration



## Consulting Services









- Consulting services for Functional Safety and Software Architectures
- Lean Software Development
- Established agile processes



## Verification and validation

- End-to-end testing of complex embedded SW systems
- Test concept development
- Independent verification and validation of SW systems

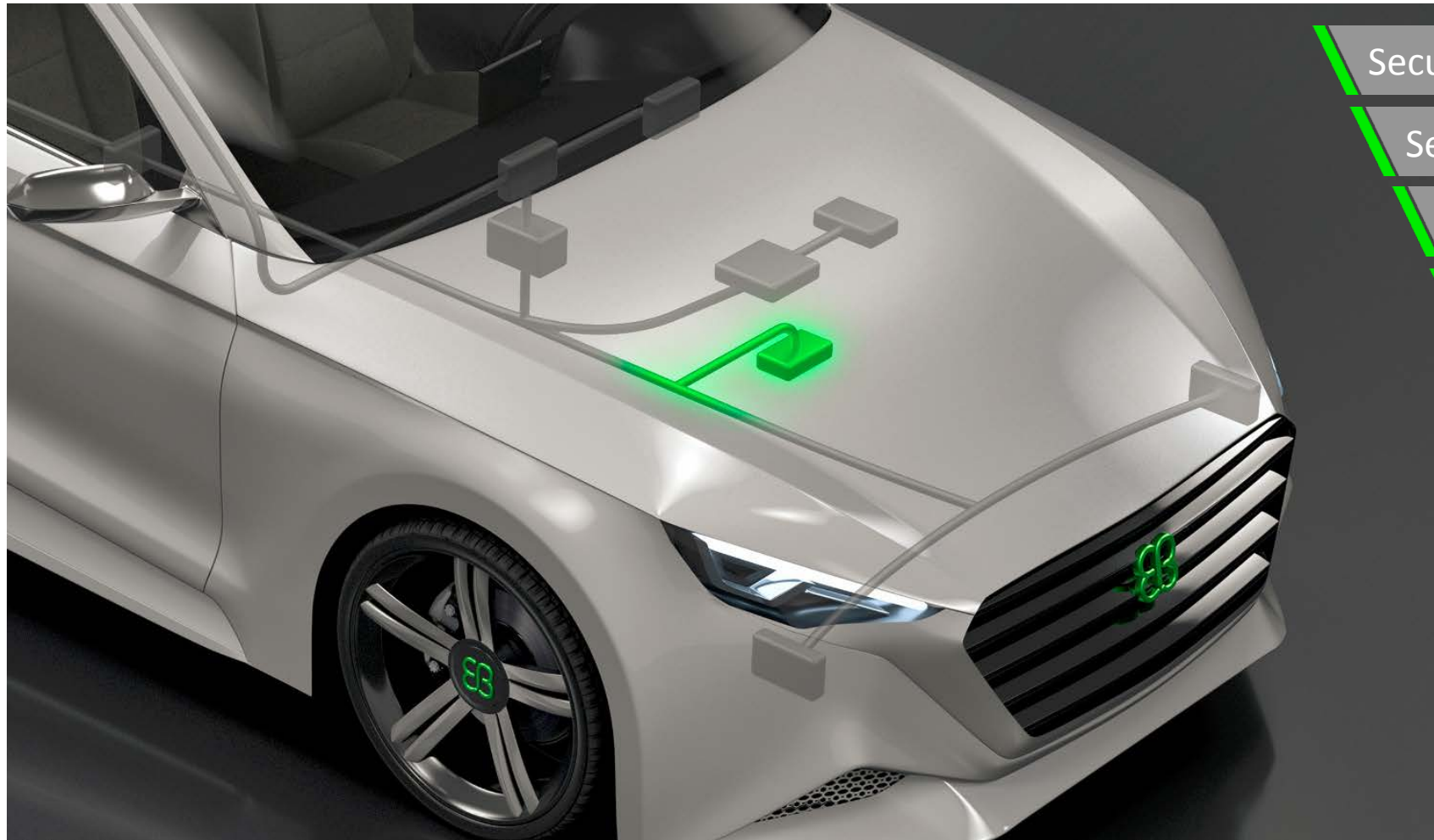
# Security – Track record

- 15 years of experience in the field of embedded security
- EB delivered SSW security modules for
  - 
  - 
  - 
  - 
  - 
- OEM consulting and project specific security solutions for
  - 
  - 
  - 
- AUTOSAR Standardization
  - Crypto: CSM and CAL
  - Secure Onboard Communication
  - WP-X Security with var. subgroups
- Various EB R&D programs for e.g.
  - Smart antenna and over the air solutions
  - Anomaly and Intrusion detection

- Mass production approved implementations for:
  - Flash protection
  - SW-Enabling (OEM-specific or HIS)
  - Anti-theft mechanisms in SW
  - Mileage protection
  - Secure Onboard Communication
  - Secure Diagnostics
  - Data protection
  - Secure Hardware Extension (SHE)
  - Hardware Security Module (HSM)
  - Driver development
  - Firmware development
- **EBs security solutions are on the street in millions of cars.**



# ECU Security



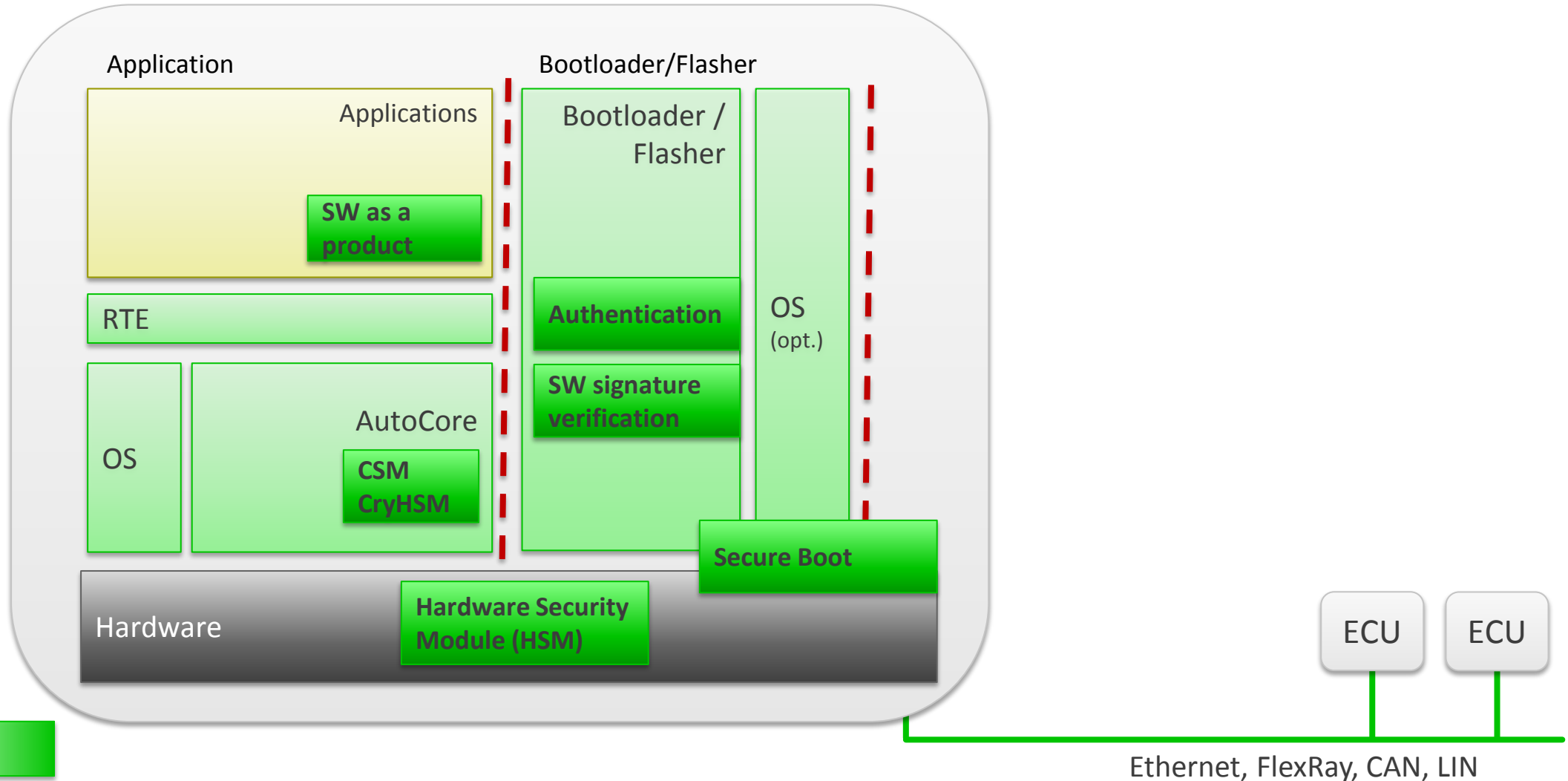
Secure update

Secure boot

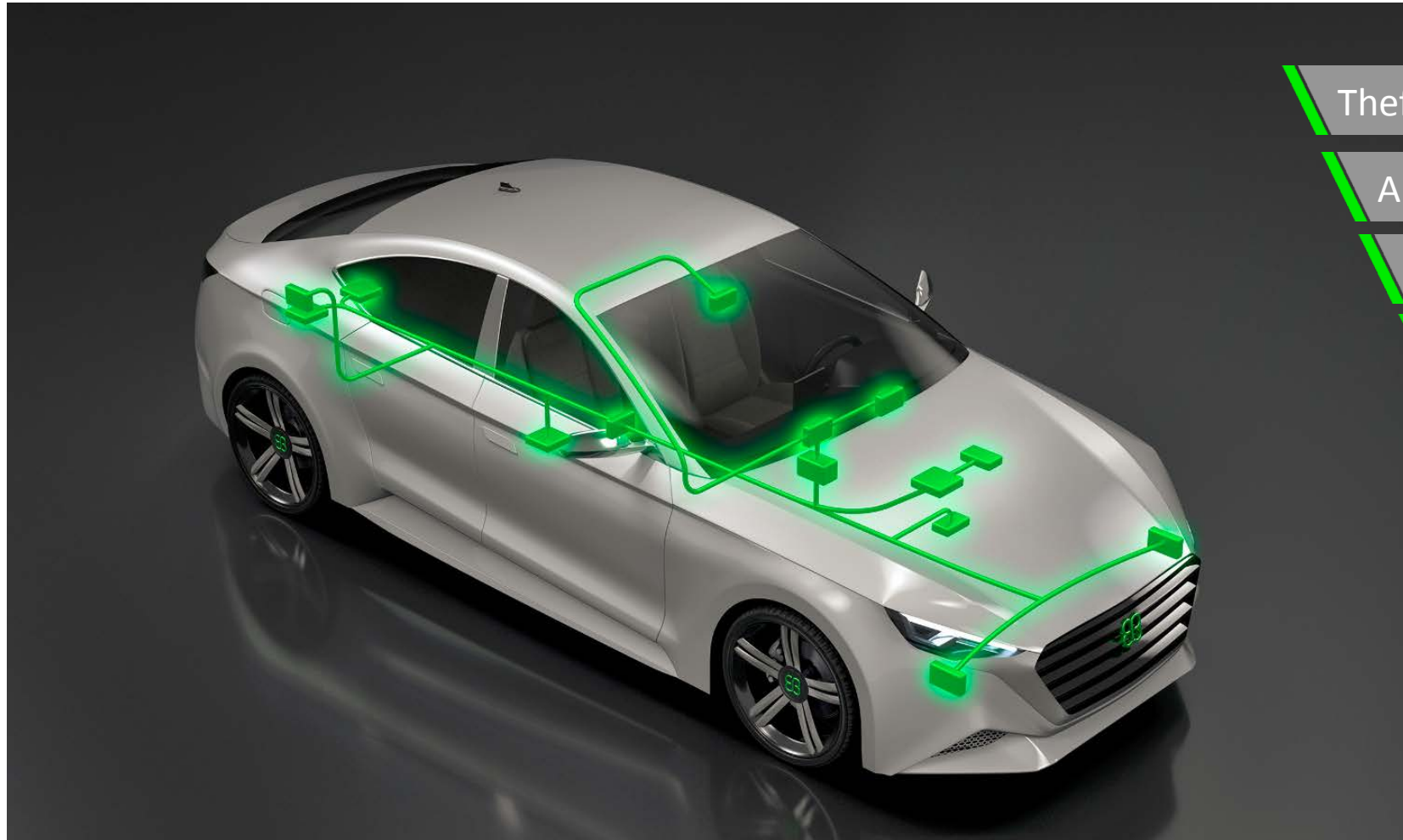
Hardware security module

Software as a product

# ECU Security Architecture (example)



# On-Board Network Security



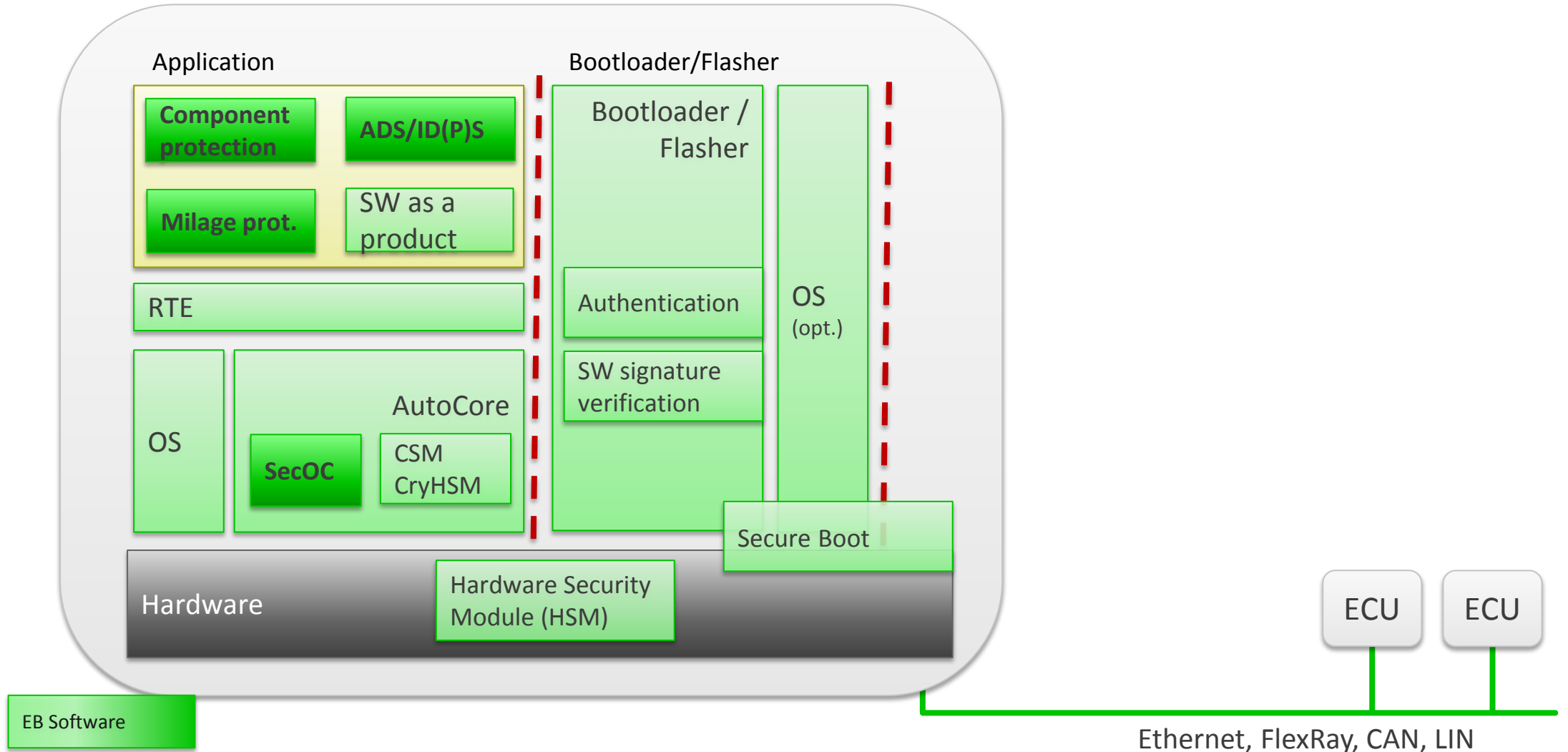
Theft protection

Anomaly detection

Intrusion detection

Secure communication

# ECU Security Architecture (example)

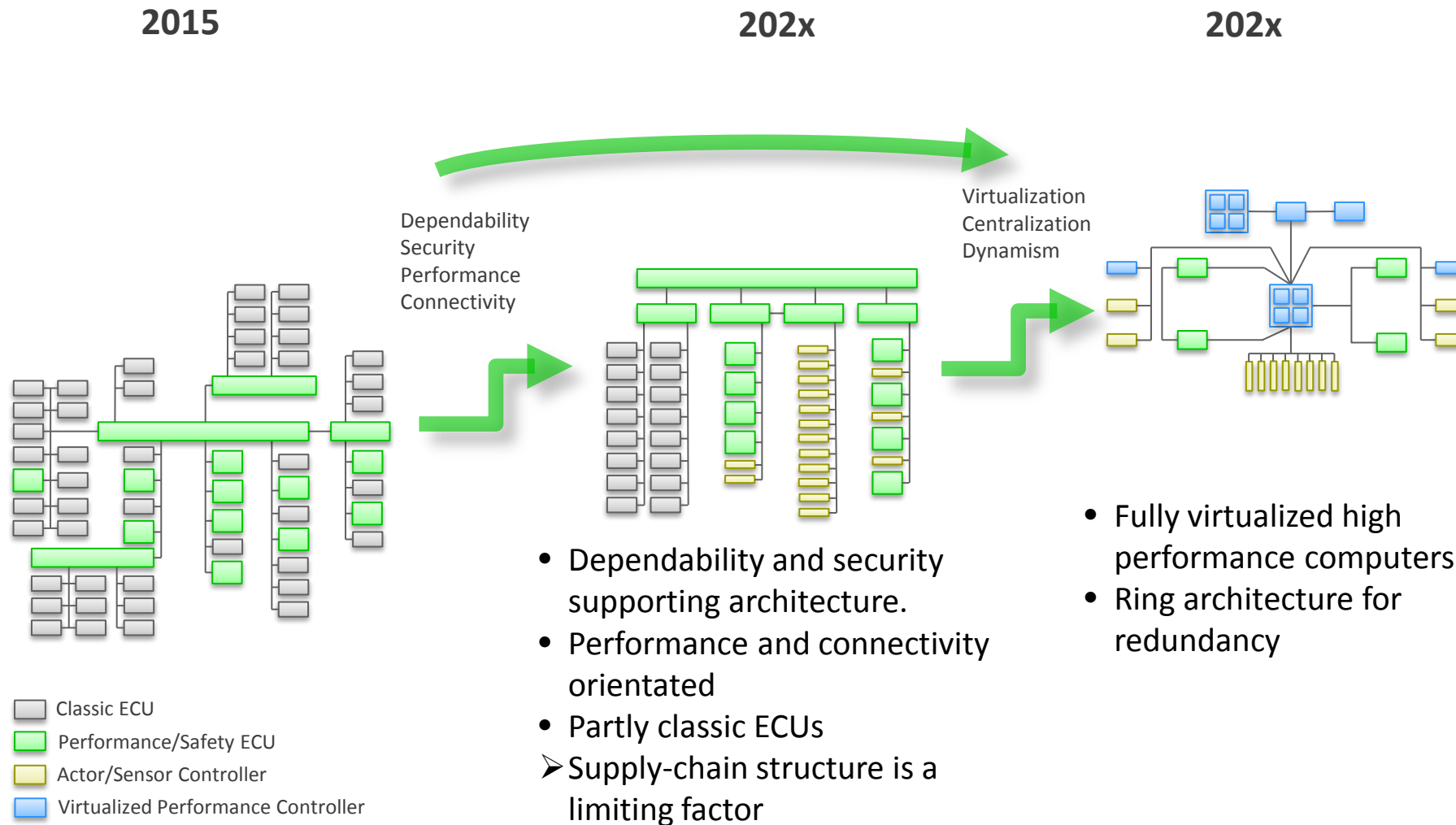




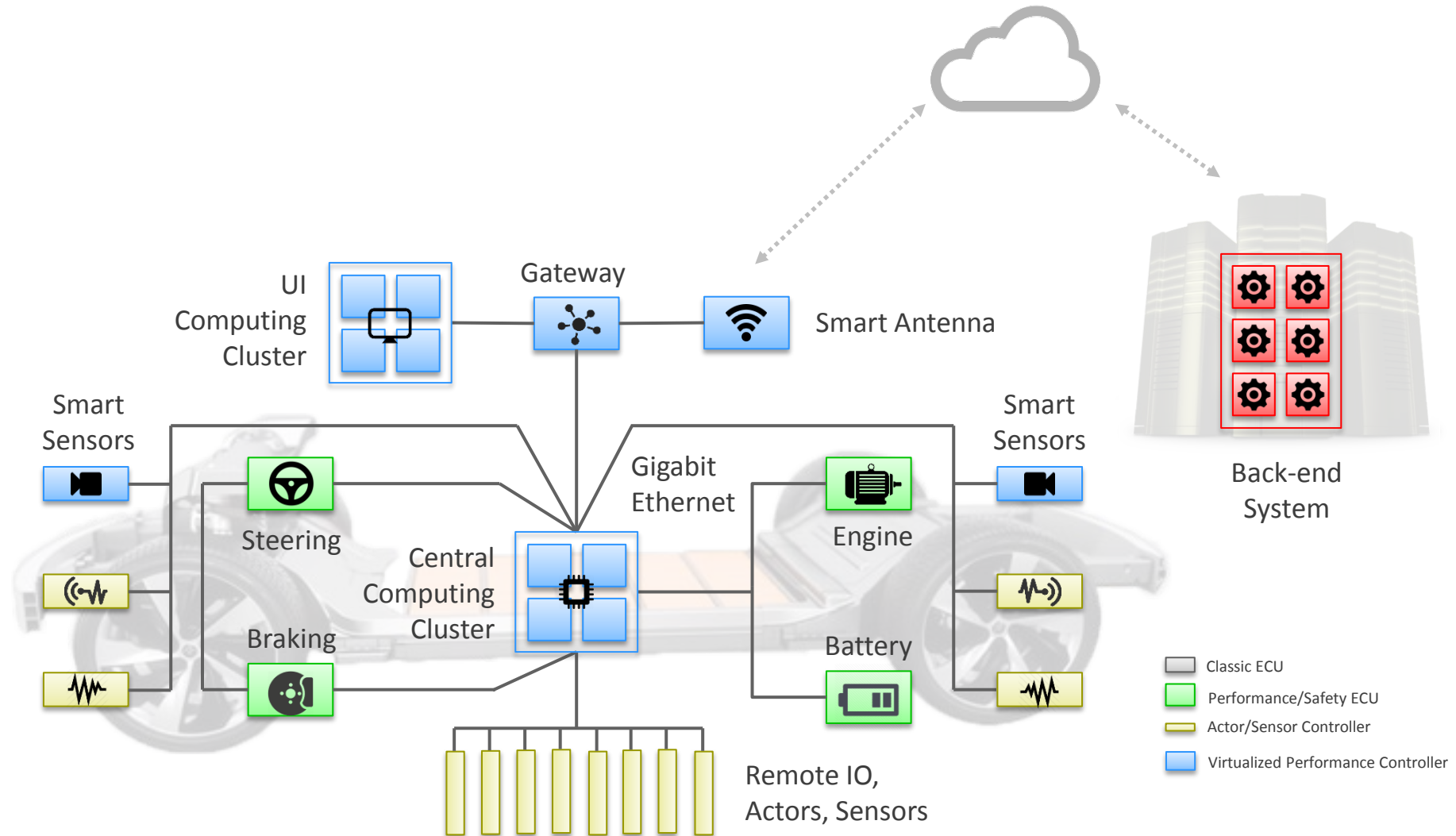
# Vehicle Security: Various Access Points



# Evolution of E/E Architectures

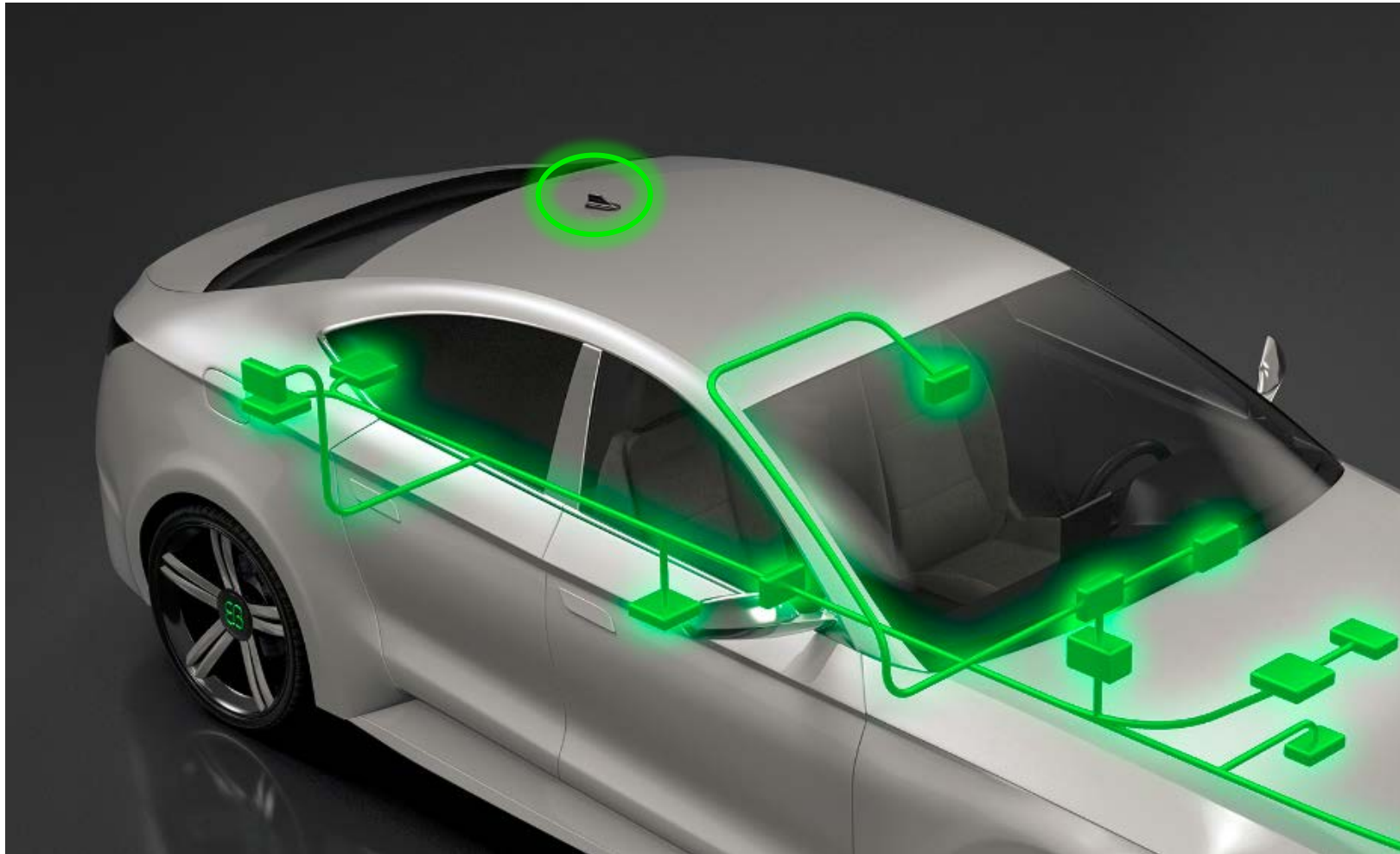


# Future E/E architecture

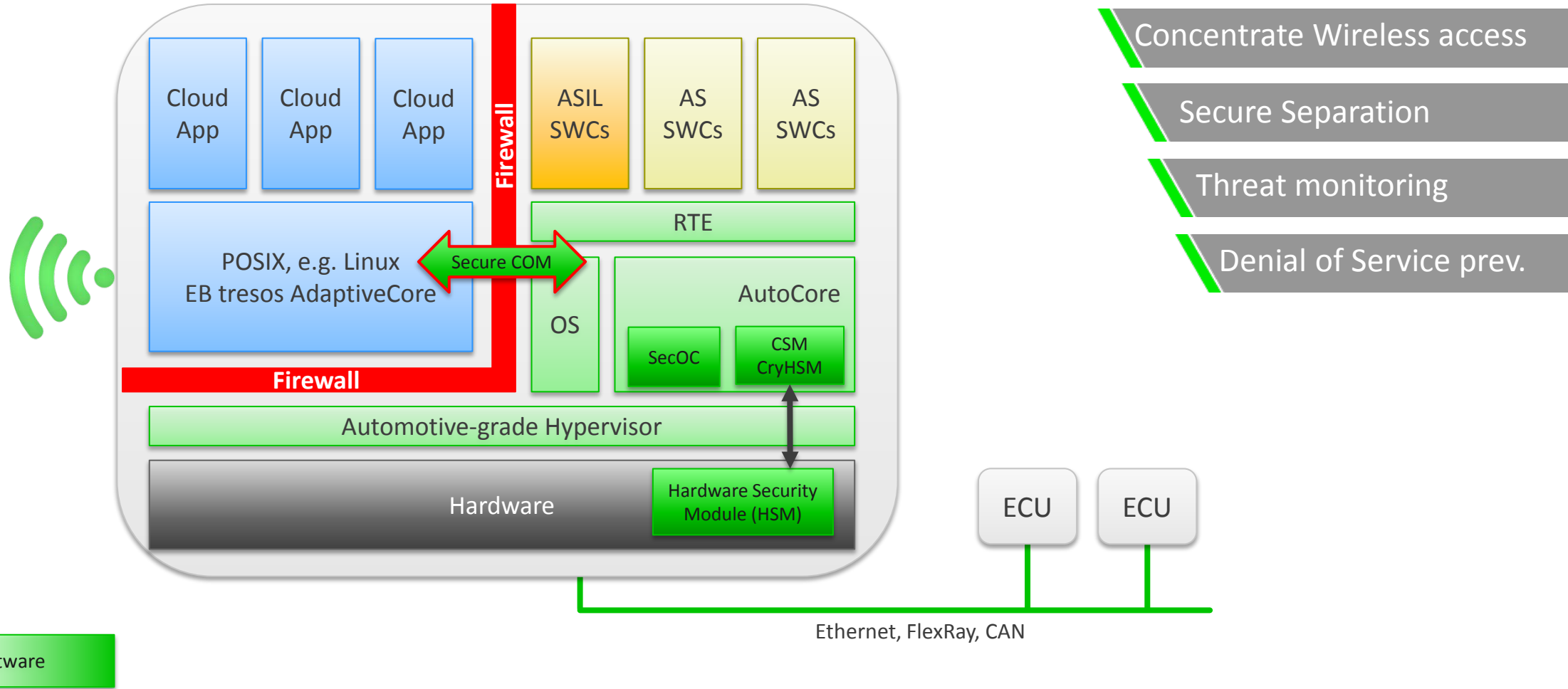




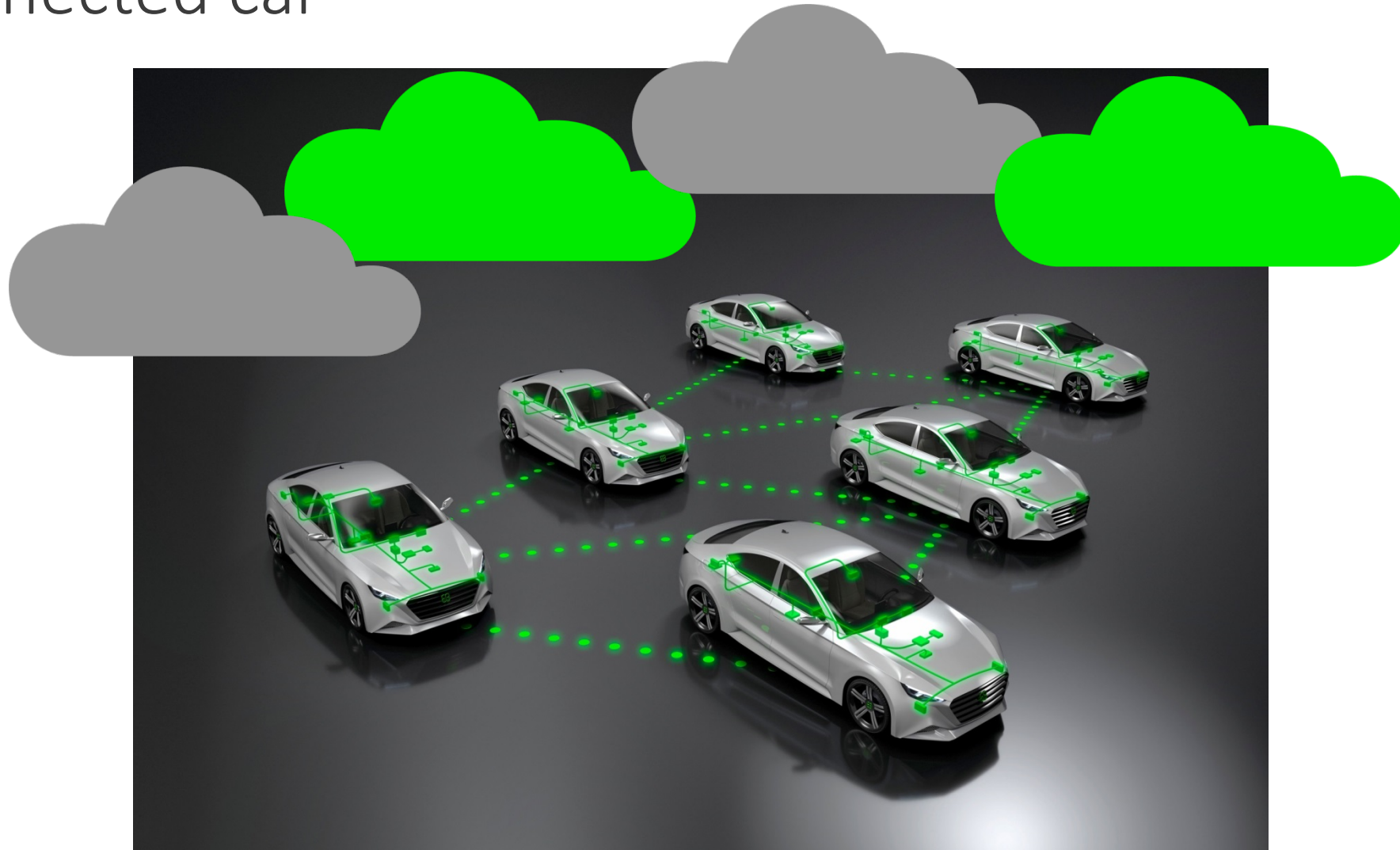
# Smart Antenna



# Connection, Separation - Smart Antenna

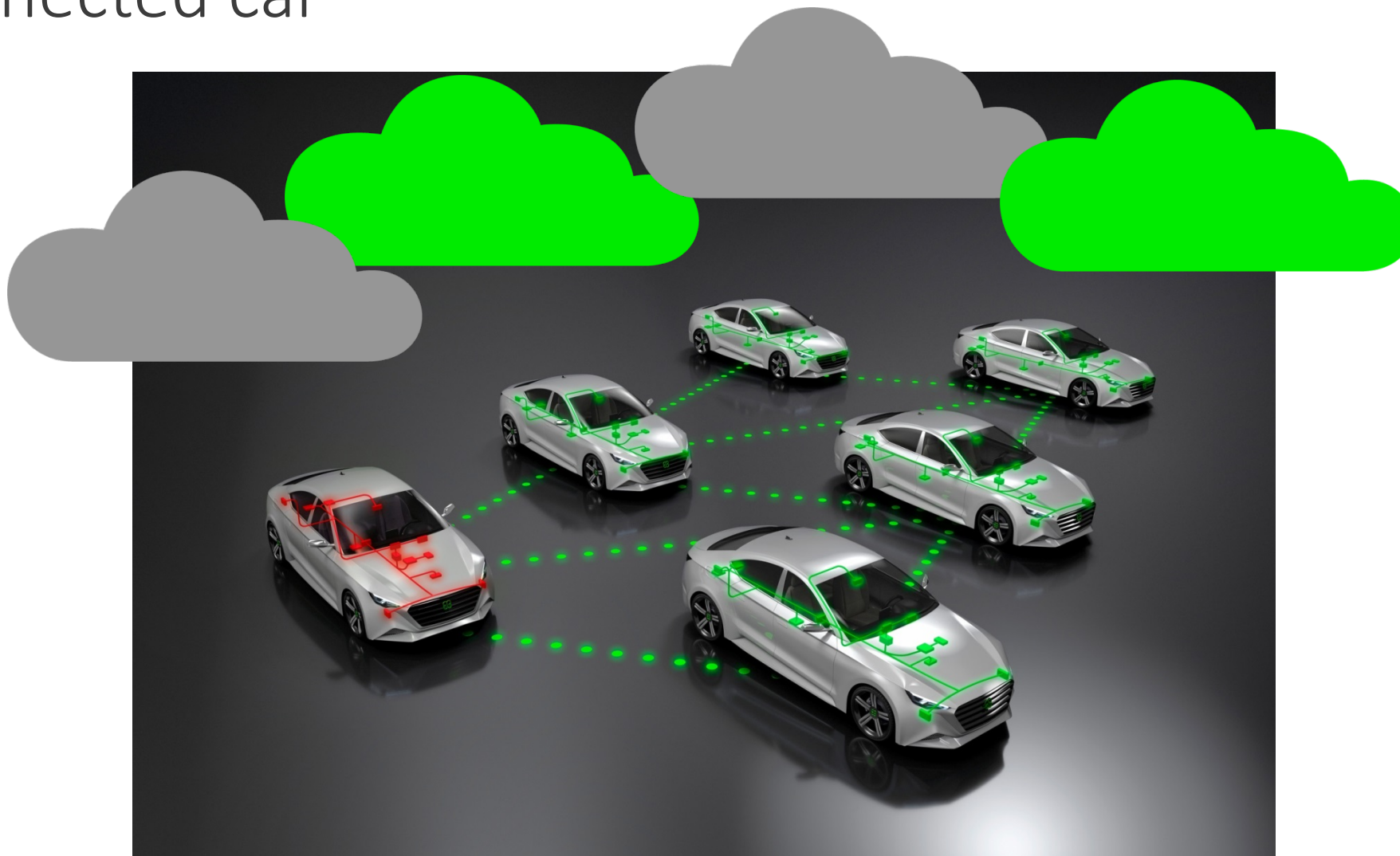


# The connected car

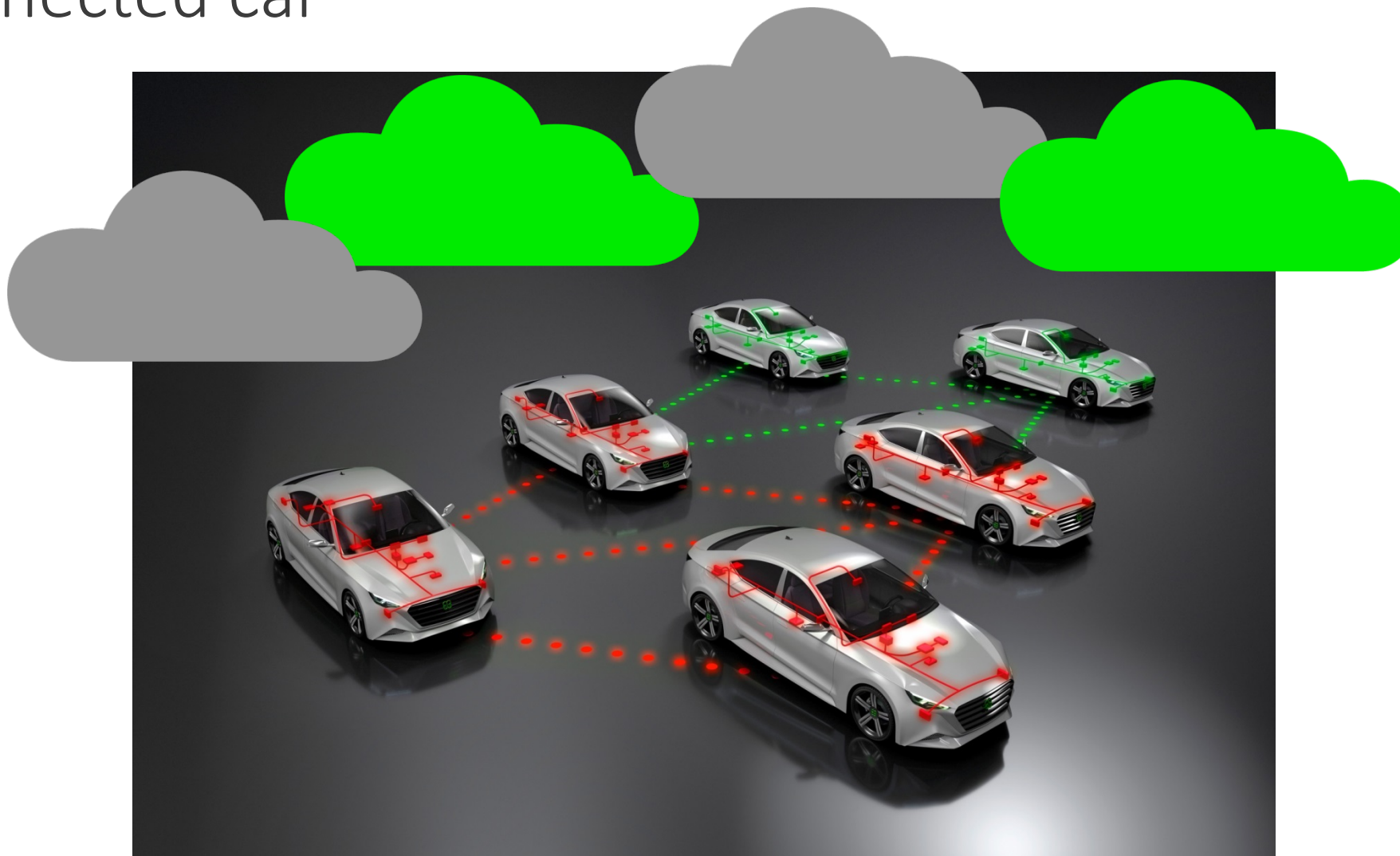




# The connected car



# The connected car

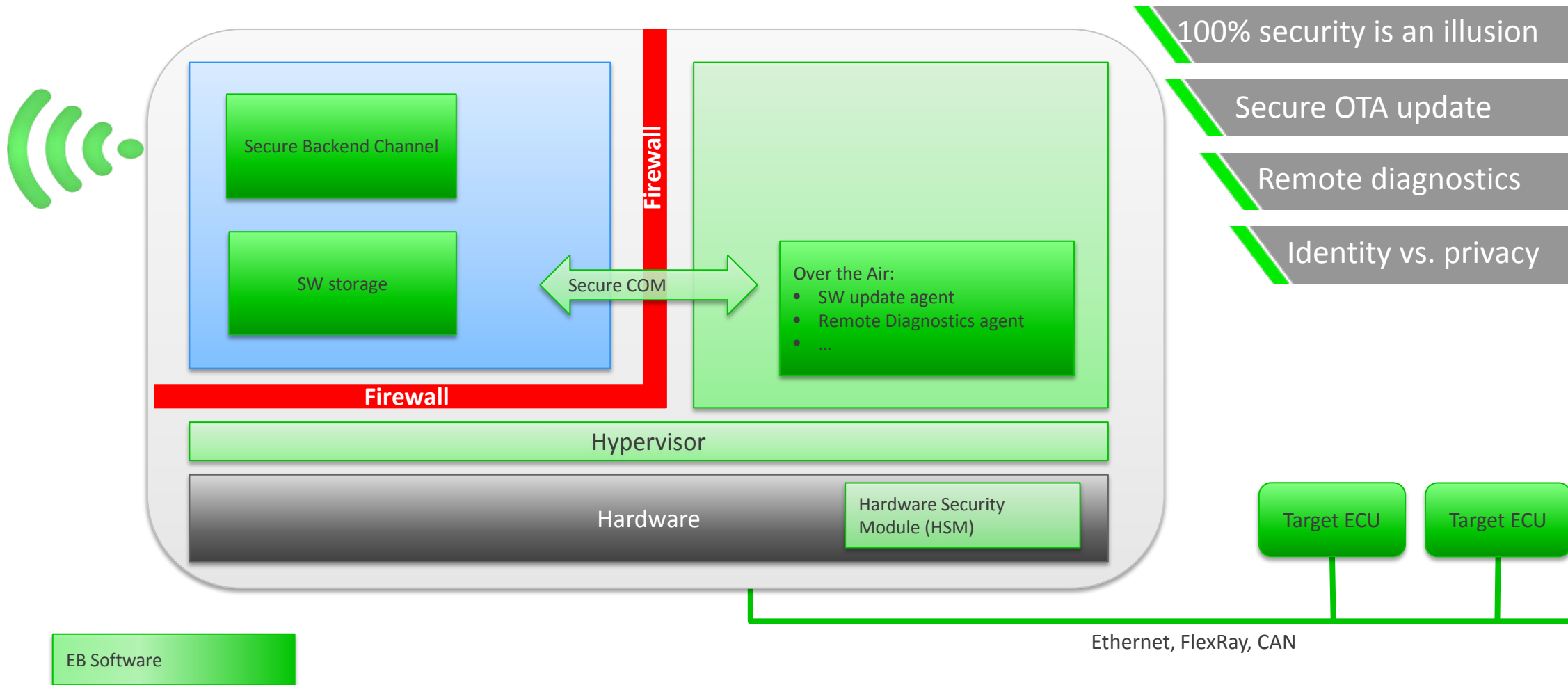


# The connected car





# Over the Air functionality

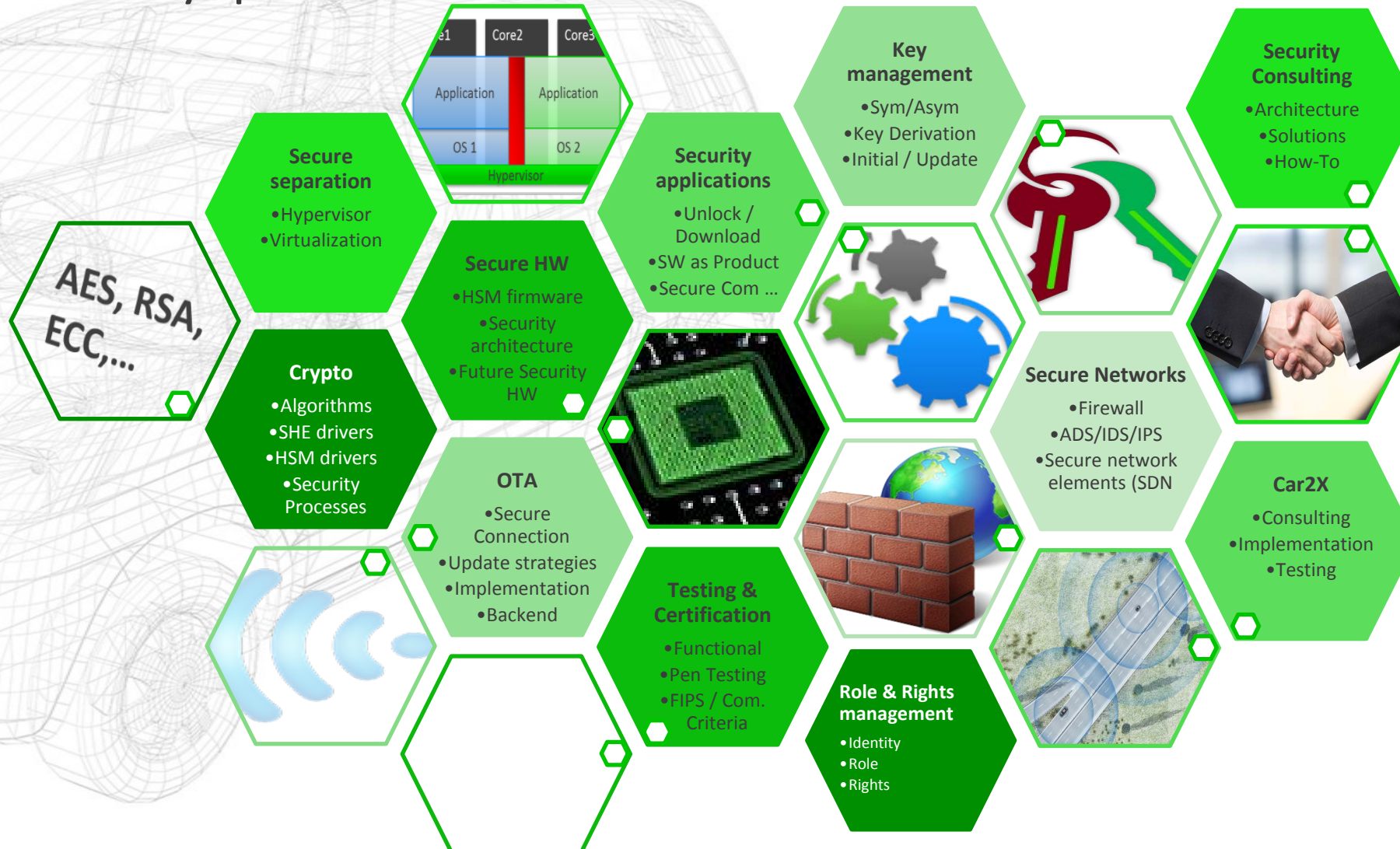


# Summary

- **Security is necessary on all levels**
  - in ECUs and between ECUs
  - in the vehicle and between vehicles
  - in the backend
- **A big challenge, but you are not alone**
  - Existing and approved mechanisms available
  - EB secures vehicles for more than 15 years
- **Security needs constant care**
  - Monitoring on all levels
  - Update over the air is key to keep cars secure



# EB security portfolio





# Get in touch!



Elektrobit

[sales@elektrobit.com](mailto:sales@elektrobit.com)  
[www.elektrobit.com](http://www.elektrobit.com)

